IoT based greenhouse

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ABSTRACT

The system proposed in this paper is an advanced solution for monitoring the weather conditions in the greenhouse and make the information visible anywhere in the world. The technology behind this is the Internet of Things (IoT), which is an advanced and efficient solution for connecting the things to the internet and to connect the entire world of things in a network. Here things might be whatever like electronic gadgets, sensors, and automotive electronic equipment. The system deals with monitoring and controlling the environmental conditions like temperature, relative humidity, with sensors and sends the information to the web page and then plot the sensor data as graphical statistics. The data updated from the implemented system can be accessible on the internet from anywhere in the world.

Keywords— *Arduino Uno, Raspberry Pi, dht11*

1. INTRODUCTION

The Internet of Things (IoTs) can be described as connecting everyday objects like smartphones, Internet TVs, sensors and actuators to the internet where the devices are intelligently linked together enabling new forms of communications between things and peoples and between things themselves. It allows the people to directly check the parameters online without the need of forecasting agency to accessing and controlling parameters. Here the different parameters are controlled automatically using microcontroller based internet application. The proposed system does not require a dedicated server PC with respect to the similar system and offers the communication protocol to monitor and control the greenhouse environment with more than just the switching functionality. Now anyone from any time and anywhere can have connectivity for anything and it is expected that these connections will extend and create an entirely advanced dynamic network of IoTs. The development of the Internet of Things will revolutionize a number of sectors, form automation, transportation, energy, healthcare, financial services to nanotechnology. IoT technology can be applied to create a new concept and wide development space for monitoring controlling Pharmaceutical sector provide intelligence, comfort and improve the quality of measurement and analysis. Hence, this will contribute to overall cost reduction and energy saving application.

2. EXISTING IOT GREENHOUSE SYSTEM

IoT greenhouse provides information such as:
- Temperature and humidity
- Light intensity
- Soil moisture
- Heating
- Watering

This is done by using the following sensor:
- Soil moisture sensor

To measure soil moisture content:
- Temperature and humidity sensor

To measure temperature and humidity:
- Arduino UNO controls fan, water pump, artificial light, motor, etc.
- The information is collected from the sensors by the Arduino UNO and it is published through the MQTT server.

Therefore, to connect the greenhouse system to the PC, the user has to specify the IP address and client port of the greenhouse with his/her client ID, then all the information will be displayed anywhere in the world.

3. DRAWBACKS OF EXISTING IOT GREENHOUSE SYSTEM
Even though, the information regarding the plant's health is being given to the user, what if something happens to it due to unexpected circumstances?
- For example, if our plant gets defected due to the insects present in it, then how will the user get to know about it?
- There must be a solution to this.
- Our proposed IOT Greenhouse system brings in a new way to solve this.

4. PROPOSED IOT GREENHOUSE SYSTEM
This new system will have the same features as that of the existing IOT Greenhouse system.
- In addition to them, we add a Raspberry Pi camera that runs the MQTT server.
- This camera will capture the entire greenhouse and identifies the defects of each and every leaf and displays the microscopic image to the user.
- Through this, the user gets an alert signal so that he/she would do the necessary to protect the plant.

5. ADVANTAGES OF PROPOSED IOT GREENHOUSE SYSTEM
This system not only gives all the information about the plant but also gives the image of the plants.
- This image is a microscopic image of the plant that gives an alert signal if it finds a defect in each and every part of the plant.
- If it finds a defect, it gives an alert signal to alert the user about it immediately and not later so that he/she can protect it from external physical factors.

6. PLANT PROTECTOR
- Data collection.
- Image processing.
- Controlling part.
- Linking PC with a greenhouse.
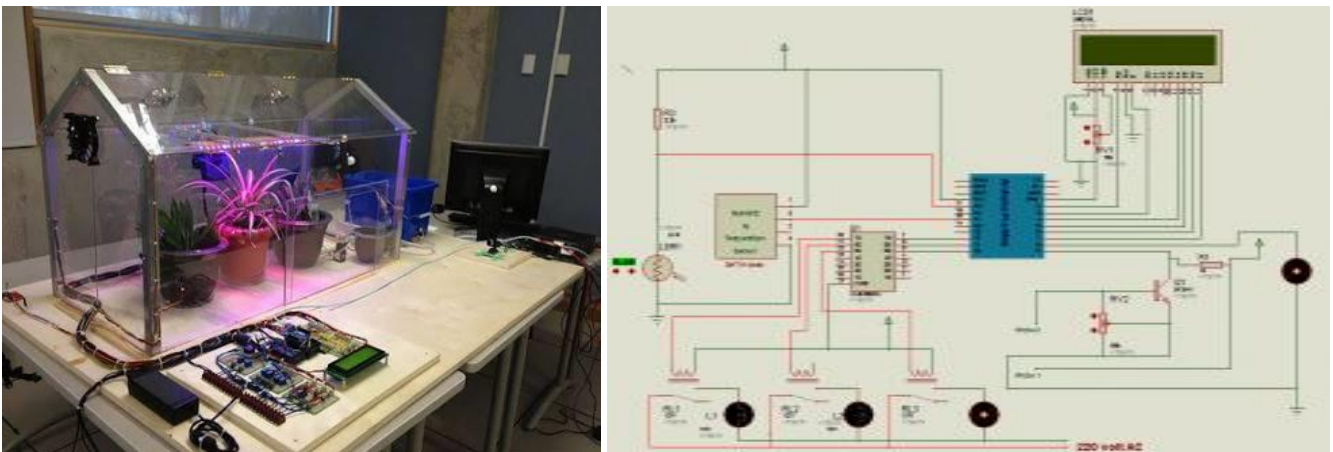
Fig. 1: Plant protector

7. ACKNOWLEDGMENT

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